

Fire & Water

Hydrology Study

Groundwater, creeks, streams, and rivers flow through the watershed of the Santa Monica Mountains on their way to the ocean as part of a huge hydrologic cycle. This water source is valuable to the mountain ecosystem.

Throughout the Santa Monica Mountains, water is continually tested to track its condition throughout the year. Conducting various hydrology tests allows National Park Service Resource Managers to make comparisons of water health before and after a fire. The effect of fire on the water system is hard to predict because it is so closely linked to the topography, soil, and plant life of each individual site. What happens to a watershed after a fire often depends on what was happening in the watershed before the fire.

Fire can alter water quality, with turbidity and sediment being the most significant changes. **Turbidity** is a visual property of water and it measures the amount of suspended particles in water, such as silt, clay, plankton, microscopic organisms and organic matter. **Sediment** is the soil that gets in the water and then settles at the bottom. Sediment can degrade water quality and affect the aquatic organisms that live there. Sedimentation decreases available habitat for organisms (specifically fish) by reducing the size of spawning beds and by harming any existing eggs. Usually, where there is steep terrain and the fire has burned hot, there is a substantial increase in sediment, as erosion causes ashy soil to flow into streams with the first rain after a fire.

As nutrient-filled ash in soil flows into streams, it changes the pH and nutrient levels of the water. Most ponds and streams are acidic. Adding ashes to water raises the pH, turning it more basic. As a result, organisms that had been living successfully in the water may die off, and others, such as algae, may grow better. Increased algae production results in a more diverse population of insect larvae, changing the balance of life in the water from what it was before the fire.

Water temperature can change as a result of fire. If trees and vegetation along the stream are burned and removed, more sunlight is allowed to penetrate. More sunlight increases the water temperature directly affecting living organisms. Higher stream temperatures decrease oxygen content changing the chemistry of the stream.

As streams and rivers continue to flow, it is interesting to monitor how much time, following a fire, it takes for the water quality to return to its pre-fire levels. Water by nature, is continuously collected, purified, and distributed through the cycle. This natural recycling and purification process provides fresh water to regulate and balance out the ecosystem once again.